

## CLAIMS

We claim:

1           1.     A substrate holder (1), in particular for a facility for epitaxial deposition of  
2     semiconductor material (3) on a substrate (2), having a substrate supporting face and a  
3     holder rear face, which faces away from this supporting face,

4           wherein

5           the substrate holder (1) has a temperature equalization structure which results in  
6     a defined temperature profile over the entire substrate surface of a substrate (2) which  
7     is located on or in the vicinity of the substrate holder (1), during a process which  
8     includes heating or cooling.

1           2.     The substrate holder as claimed in claim 1, in which the temperature  
2     equalization structure results in an as uniform as possible temperature over the entire  
3     substrate surface.

1           3.     The substrate holder as claimed in claim 1, in which the temperature  
2     equalization structure is one or more three-dimensional structures in the substrate  
3     supporting face and/or in the holder rear face.

1           4.     The substrate holder as claimed in claim 3, in which the three-dimensional  
2     structures are formed by at least one groove (4) which runs in the vicinity of the edge.

1           5.     The substrate holder as claimed in claim 4, in which the width of the  
2     groove or grooves (4) is at most 80% of the radius of the substrate holder, and the  
3     depth of the groove or grooves (4) is less than the thickness of the substrate holder (1)  
4     or of a coating which is located on the substrate supporting face.

1           6.     The substrate holder as claimed in claim 4, in which the groove or grooves  
2     (4) is or are arranged in an annular shape and concentrically.

1           7.     The substrate holder as claimed in claim 4, in which the distance between  
2     the grooves (4) in areas in which relatively high temperatures occur during or after the  
3     mentioned process, in particular during the growth of semiconductor material, is less  
4     than in the areas in which temperatures which are lower than these occur.

1           8.     The substrate holder as claimed in claim 4, in which the depth of the  
2     grooves (4) is greater in areas in which relatively high temperatures occur during the  
3     growth of the semiconductor material than in areas in which temperatures which are  
4     lower than these occur.

1           9.     The substrate holder as claimed in claim 4, in which the groove or grooves  
2     (4) has or have a quadrilateral, circular or oval cross section, or a cross section with a  
3     segment of one of these shapes.

1           10. The substrate holder as claimed in claim 1, in which the temperature  
2 equalization structure comprises texturing.

1           11. The substrate holder as claimed in claim 10, in which the texturing  
2 includes two or more trenches and/or pits, the distance between which is matched to  
3 the temperature profile of the substrate holder (1), in such a way that the distance  
4 between trenches and/or pits in areas in which relatively high temperatures occur during  
5 the growth of the semiconductor material is less than in areas in which temperatures  
6 which are lower than these occur.

1           12. The substrate holder as claimed in claim 10, in which the texturing  
2 includes two or more trenches and/or pits, whose depth is matched to the temperature  
3 profile of the substrate holder (1) such that the trenches and/or pits are deeper in areas  
4 in which relatively high temperatures occur during the growth of semiconductor material  
5 than in areas in which temperatures which are lower than these occur.

1           13. The substrate holder as claimed in claim 10, in which the texturing  
2 includes  
3           - trenches wherein at least some of these cross one another,  
4           - trenches wherein at least some of these are arranged parallel to one  
5 another,

- 6           -       trenches where at least some of these are curved,
- 7           -       pits which are in the form of dots, circles or cuboids,
- 8           -       pits which have a combination of dotted, circular and/or cuboid shapes, or
- 9           -       trenches and/or pits which have a combination of at least two of the
- 10 shapes mentioned above.

1           14.    The substrate holder as claimed in claim 1, in which the temperature  
2 equalization structure comprises two or more circulating steps of different depths.

1           15.    The substrate holder as claimed in claim 14, in which the steps are  
2 arranged concentrically and centrally.

1           16.    The substrate holder as claimed in claim 14, in which the surface which is  
2 provided with steps has a continuously stepped relief.

1           17.    The substrate holder as claimed in claim 14, in which the depth of the  
2 steps is matched to the temperature profile of the substrate holder (1), such that the  
3 depth of the steps is greater in areas in which relatively high temperatures occur during  
4 the growth of semiconductor material than in areas in which temperatures which are  
5 lower than these occur.

1           18. The substrate holder as claimed in claim 1, in which the substrate  
2 supporting face has a substrate support structure, by means of which, when the  
3 substrate is supported, a gap (8) is formed between the substrate (2) and the substrate  
4 holder.

1           19. The substrate holder as claimed in claim 18, in which the substrate  
2 support structure is designed such that essentially only the edge or those areas of the  
3 substrate (2) which are on the edge are supported, and the substrate (2) essentially  
4 makes no contact with the substrate holder (1) anywhere else.

1           20. The substrate holder as claimed in claim 18, in which the substrate  
2 support structure has a step which surrounds the substrate.

1           21. The substrate holder as claimed in claim 18, in which the substrate  
2 support structure comprises at least one substrate stop for holding the substrate (2),  
3 wherein the substrate stop has a substrate support surface (9) above the substrate  
4 holder surface.

1           22. The substrate holder as claimed in claim 21, in which the substrate stop is  
2 formed by means of a hemisphere or a platform (6) with an incision (7), which has at  
3 least one substrate support surface (9) parallel to and above the substrate holder  
4 surface.

1           23.    The substrate holder as claimed in claim 1, in which a recess is provided  
2    on the substrate supporting face of the substrate holder (1) and is at least sufficiently  
3    large that the substrate (2) can at least partially be arranged in the recess, parallel to  
4    the support surface of the substrate holder (1).

1           24.    The substrate holder as claimed in claim 1, in which the surface of the  
2    substrate holder has a roughness of less than 10  $\mu\text{m}$ .

1           25.    The substrate holder as claimed in claim 1, in which the substrate holder  
2    (1) has a ground and/or polished surface.

1           26.    A facility for epitaxial deposition of a semiconductor material (3) on a  
2    substrate (2) having at least one reactor, one gas mixing system and one exhaust gas  
3    system, with the reactor having at least one substrate holder (1), a mount for the  
4    substrate holder (1) and a means for heating,

5           wherein

6           the substrate holder (1) is designed as claimed in claim 1.